REMARKS

Claims 1-14 were pending in this application. Claims 2 and 14 have been canceled. Currently pending claims 1 and 3-13 have been amended.

The Examiner objects to the drawings and the disclosure on the basis that Figure 3 is missing. A copy of Figure 3 accompanies this response.

Applicant has submitted a Petition under 37 CFR 1.84(a)(2) to submit a color rendition of Figure 3. The color drawing depicts the subject matter of Figure 3 as described on page 4, line 23 and page 12, line 19 of the specification. In addition, the specification has been amended as required to recite that the patent or application file contains at least one drawing executed in color.

Also in response to the Examiner's objections to the drawings and disclosure, Applicant has submitted a proposed corrected Figure 2 which depicts a color correction matrix and has made a corresponding amendment to the specification.

The Examiner objects to the drawings on the basis that the method of weighting and processing colors is not shown. Applicant respectfully submits that the specification (e.g. pages 10-11) adequately describes the method of weighting and processing colors, and the requirements of MPEP 608.02 are met. Claim 6 has been amended to remove reference to an image interpolator.

Page 12, line 4 of the specification has been amended to correct a typographical error in the term "Bayer pattern."

The Examiner objects to claims 1 and 12 on the basis of informalities. Applicant has amended claims 1 and 12 to correct the misspelled terms in response to the objection.

Claims 1, 2, 3 and 14 stand rejected under 35 U.S.C. § 112, second paragraph, on the basis of indefiniteness. Applicant has amended claims 1, 2, 3 and 14 for clarity. The claims particularly point out and distinctly claim the subject matter of the invention.

Claims 1, 3-9 and 12-13 stand rejected under 35 U.S.C. § 102(e) as being anticipated by U.S. Patent No. 6,320,668 (Kim). Claims 2, 10-11, and 14 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over Kim in view of Japanese Publication No. 02-074367 (Yamaguchi). Applicant respectfully traverses all prior art rejections.

The present invention as recited in amended independent claim 1 is a color correction method. The method includes "obtaining reference outputs from an image sensor using a color image array, said reference outputs being indicative of outputs for a plurality of known reference colors, said plurality including at least three primary colors, and at least two other non-primary colors," "determining an error measure for some of said plurality of known reference colors between said reference outputs and what would be expected for each of said reference outputs," and "determining a *weighted* error measure for others of said plurality of known reference colors between said reference outputs and what would be expected for each of said reference outputs." The method further includes "obtaining a color correction matrix to minimize said error measure or weighted error measure for each of said plurality of reference colors" and "using said color correction matrix to simultaneously optimize color correction for each of said plurality of reference colors to obtain a color-corrected image."

Kim discloses an imaging system in which all errors between colorimetric scanning data and data obtained by scanning a test pattern are minimized using a color correction matrix. As the Examiner admits, Kim fails to teach weighting certain colors more than others. Thus, Kim does not teach or suggest "obtaining reference outputs from an image sensor using a color image array, said reference outputs being indicative of outputs for a plurality of known reference colors, said plurality including at least three primary colors, and at least two other non-primary colors," "determining an error measure for some of said plurality of known reference colors between said reference outputs and what would be expected for each of said reference outputs," and "determining a *weighted* error measure for others of said plurality of known reference colors between said reference outputs and what would be expected for each of said reference outputs." Further, Kim

does not teach or suggest "obtaining a color correction matrix to minimize said error measure or weighted error measure for each of said plurality of reference colors" and "using said color correction matrix to simultaneously optimize color correction for each of said plurality of reference colors to obtain a color-corrected image." Accordingly, Kim does not anticipate or render obvious the claimed invention.

Yamaguchi (abstract) does not cure the deficiencies of Kim. Yamaguchi discloses a method of color correction in which the importance (or weight) of a color is determined by making several sets n (n = 65 or more) of input data and output data. No suggestion or motivation to combine Kim with Yamaguchi exists. Kim teaches reducing error to a minimum. Kim contains no motivation to modify the error correction matrix or provide a weighted error correction system. Yamaguchi discloses a particular weighting system, different than that of the present invention and obtained in a different manner, which utilizes weighting based on 65 duplications. Absent an improper hindsight reliance on applicant's teachings, the necessary motivation to combine Yamaguchi with Kim is lacking.

Further, even if Kim and Yamaguchi were properly combinable, the proposed combination at best teaches a two step process in which the errors are minimized, and then the output is weighted based on a plurality of duplications. However, this does not teach or suggest "obtaining reference outputs from an image sensor using a color image array, said reference outputs being indicative of outputs for a plurality of known reference colors, said plurality including at least three primary colors, and at least two other non-primary colors," "determining an error measure for some of said plurality of known reference colors between said reference outputs and what would be expected for each of said reference outputs," and "determining a weighted error measure for others of said plurality of known reference colors between said reference outputs and what would be expected for each of said reference outputs." Further, the proposed combination does not teach or suggest "obtaining a color correction matrix to minimize said error measure or weighted error measure for each of said plurality of reference colors" and "using said color correction

matrix to simultaneously optimize color correction for each of said plurality of reference colors to obtain a color-corrected image."

The present invention as recited in amended independent claim 6 is an image sensor apparatus that includes "an image sensor device, operating using a color filter array which provides color filtering such that colors transmitted to each pixel are measured to determine all color components that actually impinge on an area of said pixel," and "an image processor, operating according to a color correction matrix, said color correction matrix being adjusted according to at least three primary colors, and at least two additional non-primary colors wherein said color correction matrix has some colors weighted for color correction more than other colors."

As noted above, Kim does not teach or suggest a system in which some colors are weighted for color correction more than other colors. Yamaguchi does not cure the deficiencies of Kim. Yamaguchi discloses an apparatus using a method of color correction in which 65 or more duplicate sets of input and output data are used to determine the importance of a color. The prior art lacks motivation for the proposed combination, as noted above. Further, Yamaguchi does not combine with Kim to suggest an image sensor apparatus that includes "an image sensor device, operating using a color filter array which provides color filtering such that colors transmitted to each pixel are measured to determine all color components that actually impinge on an area of said pixel," and "an image processor, operating according to a color correction matrix, said color correction matrix being adjusted according to at least three primary colors, and at least two additional non-primary colors wherein said color correction matrix has some colors weighted for color correction more than other colors," as recited in the present claim 6. Thus, claim 6, and its dependent claims 7-12, are submitted as being patentable over the cited prior art.

The present invention as recited in amended independent claim 13 is a method of correcting an image from an image sensor. The method includes "dividing the image sensor into a plurality of pixels," "placing color separators over said plurality of pixels, such that each pixel receives incoming light that is filtered to emphasize one color component,"

and "obtaining a color correction matrix for said pixels, said color correction matrix being one which takes into account correction of incoming radiation for at least three primary colors, and two other non-primary colors, wherein said non-primary colors are weighted such that said correction matrix corrects for some of said non-primary colors more than said primary colors."

Kim discloses an imaging system in which all errors between colorimetric scanning data and data obtained by scanning a test pattern are minimized using a color correction matrix. As the Examiner admits, Kim fails to teach weighting certain colors more than others. Accordingly, Kim does not anticipate or render obvious the present invention as recited in amended claim 13.

Yamaguchi (abstract) does not cure the deficiencies of Kim. Yamaguchi (abstract) discloses an image processing system that determines color output based upon the importance of a color. The importance of a color is determined by making several sets n (n = 65 or more) of input data and output data.

No suggestion or motivation to combine Kim with Yamaguchi exists. Kim teaches an error correction method in which all errors are minimized using a correction matrix. Kim contains no motivation to modify the error correction matrix or provide a weighted error correction system. Yamaguchi discloses a particular weighting system, different than that of the present invention and obtained in a different manner which utilizes weighting based on 65 duplications. Absent an improper hindsight reliance on applicant's teachings, the necessary motivation to combine Yamaguchi with Kim is lacking. Further, even if Kim and Yamaguchi were properly combinable, the proposed combination at best teaches a two step process in which the errors are minimized, and then the output is weighted based on a plurality of duplications. This still would not be a method that includes "dividing the image sensor into a plurality of pixels," "placing color separators over said plurality of pixels, such that each pixel receives incoming light that is filtered to emphasize one color component," and "obtaining a color correction matrix for said pixels, said color correction matrix being one which takes into account correction of incoming

radiation for at least three primary colors, and two other non-primary colors, wherein said non-primary colors are weighted such that said correction matrix corrects for some of said non-primary colors more than said primary colors."

In view of the above, each of the presently pending claims in this application is believed to be in immediate condition for allowance. Accordingly, the Examiner is respectfully requested to withdraw the outstanding rejections of the claims and to pass this application to issue.

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Respectfully submitted,

By_____

Thomas J. D'Amico
Registration No.: 28,371
Peter McGee
Registration No. 35,947
DICKSTEIN SHAPIRO MORIN & OSHINSKY LLP
2101 L Street NW
Washington, DC 20037-1526
(202) 785-9700
Attorneys for Applicant